Have Seed Will Travel

LESSON THEME
This lesson introduces students to the concept of adaption to increase an organism's ability to survive.

OBJECTIVES

Students will
•Compare plants unique adaptations to reproducing in their environment

NASA SUMMER OF INNOVATION

UNIT
Life Science— Plants

GRADE LEVELS
4 – 6

CONNECTION TO CURRICULUM
Science

TEACHER PREPARATION TIME
1 to 2 hours to gather seed types

LESSON TIME NEEDED
1 hour *Complexity: Basic*

NATIONAL STANDARDS

Science and Technology Standards
- Abilities to distinguish between natural objects and objects made by humans

Life Science Standards
- Characteristics of organisms
- Organisms and environments

Science in Personal and Social Perspectives
- Characteristics and changes in populations
- Changes in environments

Life Science Standards
- Diversity and adaptations of organisms

Science as Inquiry
- Understanding of scientific concepts
- Skills necessary to become independent inquirers about the natural world

MANAGEMENT
The activity in this lesson can be done with cooperative groups of two students or individuals. Safety practices should be reviewed and observed during the activities. Please note this is a simple activity, which introduces the idea of adaptation.

CONTENT RESEARCH

A seed is a plant embryo wrapped in a protective covering. A fruit is the ripened ovary of a plant, which contains one or more seeds.

Most plants are rooted in place, which makes dispersing their fruits and seeds particularly important. Seeds that are spread far from the parent plant avoid competition with their relatives for resources and have the opportunity to colonize new areas. Both fruits and seeds have a variety of adaptations for different types of dispersal. These types include: wind, water**,** animals: internal transport, and animals: external transport.

MATERIALS
- Activity sheet per student or group
- Enough of the following seed types for each group or individual to work with:
  acorn, maple, sticktight, dandelion, burr, coconut, peach, milkweed, apple, pine

Key Terms:
Fruit: the ripened ovary of a plant, which contains one or more seeds
Seed: a plant embryo wrapped in a protective covering

LESSON ACTIVITIES

Activity: Have Seed Will Travel
Activity illustrates how plants use a variety of seed distribution methods in order to reproduce and colonize other locations. Activity can be found in "SciFiles guide: The Case of the Habitable Habitat," page 41.

http://scifiles.larc.nasa.gov/docs/guides/guide3c_01.pdf

RELATED RESOURCES
Our World: Plants in Space Video
Find out how plants use light to make their own food in a process called photosynthesis. See how NASA uses LED lights to help grow plants in space. Design your own plant growth chamber like the ones used by NASA.
http://www.nasa.gov/audience/foreducators/nasaeclips/search.html?terms=plants

NASA SciFiles: The Case of the Habitable Habitat Segment 3 video

http://scifiles.larc.nasa.gov/docs/guides/guide3c_01.pdf

NASA Why? - Plants In Space Video
Files segment explaining how scientists are studying how to grow plants in space
Location: http://nasa.ibiblio.org/details.php?videoid=6389&start=100&query=SCI%20Files&action=search

DISCUSSION QUESTIONS

- Over time, living things make adaptations to survive in their surroundings. What types of adaptations can plants make? *Answers may vary but have to do with making use of wind, water, animals: internal transport, and animals: external transport*
- If all seeds from a plant fell under the same plant from which they grew, what do you think would happen to that area and the plant*? The area would become too crowded and many would not survive, and you would only find that type particular plant in that area and not in other locations*

ASSESSMENT ACTIVITIES

- The assessment is actual the activity worksheet.

ENRICHMENT
NASA Quest Activity: How Does Nature Adapt to Extremes?

Have students look at special physical adaptations and behaviors of animals and design an organism (plant or animal) that could survive in the harsh, extreme conditions found in Antarctica
http://quest.nasa.gov/antarctica/tg/program2.html